symbols Cu and Si indicating that these elements may possibly be absent).

Of course, the invention may apply to other magnetic alloys.

By way of example, an iron-based alloy was produced which had the following atomic composition:

$Fe_{73.5}Cu_1Nb_3Si_{13.5}B_9$.

The numbers given as subscripts for the elements of the alloy correspond to the atomic percentages of these elements in the alloy.

The iron alloy in the liquid state is cast on an efficiently cooled roll made of a good heat conductor, so as to obtain strips or ribbons in the amorphous state with a thickness of around 20 μm and a width of greater than 5 mm.

The strips or ribbons in the amorphous state are then subjected to an annealing heat treatment at a temperature close to 550°C for a time of about one hour in order to obtain a structure composed of fine crystals, or nanocrystalline structure, within a significant volume fraction of the strip, for example a structure consisting, by volume, of at least 50% of grains having a size smaller than 100 nm.

The treatment according to the invention is used to obtain, by cutting the strip, shaped magnetic components, while preventing the metal strip from fracturing during cutting. The treatment process according to the invention is generally carried out on the strip in the nanocrystalline state. In certain cases, the treatment according to the invention may be carried out on a strip in the amorphous state, a subsequent heat treatment allowing the nanocrystalline structure to develop.

The strip, wound in the amorphous state, may be introduced into a heat treatment furnace so as to obtain a nanocrystalline strip wound on a mandrel after the heat treatment. This heat treatment may be carried out in a magnetic field.

The treatment according to the invention

consists firstly in covering one side of the strip made of a nanocrystalline alloy with a coating layer comprising a polymer. The strip covered on one of its sides with a layer of material containing a polymer may be handled without any risk of fracture. The strip can then be covered on its second side with a layer of material containing a polymer and the two layers covering the strip are made to adhere to the faces of the strip by applying pressure and/or by a heat treatment.

It is then possible to superpose and join together, for example by adhesive bonding, pressure or heat treatment, several metal strips covered on one or both sides with a layer containing a polymer, so as to obtain laminated composite parts comprising several superposed metal layers separated by layers containing a polymer material.

The treatment according to the invention includes an additional operation, for example an operation of machining or forming the metal strip coated on both its sides or the laminated composite strip, in order to obtain shaped components, for example by cutting the strip.

As may be seen in figure 1, in a first method of implementing the treatment process according to the invention, a nanocrystalline strip 1 is covered on the first side and then on the second side with an adhesive material consisting of a plastic film precoated with adhesive.

The strip 1 of nanocrystalline alloy is wound onto a mandrel 2 having a radius of curvature sufficient to prevent deformation or excessive stressing of the strip 1. The winding onto the mandrel 2 is carried out on the cast and cooled strip in the amorphous state, which is then heat treated at about 550°C in the wound state on the mandrel.

Firstly, a strip 3 made of a polymer material precoated with adhesive is bonded to one side of the strip 1 unwound from the mandrel 2. The strip 3 of

polymer material precoated with adhesive is unwound from a reel and then applied and pressed against the strip 1 of nanocrystalline alloy by a press roll in an arrangement opposite the reel consisting of the strip 1 of nanocrystalline alloy wound on the mandrel 2. In this way, the strip 3 is brought into contact with the upper side of the strip 1 of nanocrystalline alloy, and made to adhere thereto, at the exact point where the strip 1 is unwound. In this way, any handling of a length of strip 1 not covered with a layer of plastic precoated with adhesive is avoided.

The strip 1 of nanocrystalline alloy covered on its upper side with the strip 3 made of polymer material is brought into contact, on its lower side, with a second strip 3' made of a polymer material precoated with adhesive wound in the form of a reel. Two opposed press rolls 4 and 4' are used to exert pressure on the strip 1 covered with the strips 3 and 3' made of polymer material. The pressure exerted by the press rolls 4 and 4' makes it possible to achieve good adhesion of the strips 3 and 3' to the faces of the strip 1 made of nanocrystalline alloy.

It is possible, so as to further improve the adhesion of the strips 3 and 3' to the faces of the strip made of nanocrystalline alloy 1, to make the laminated strip consisting of the strip 1 covered with the layers 3 and 3' pass through a heat treatment unit 5 within which the adhesive material of the strips 3 and 3' is crosslinked, thereby improving the quality of the bonding.

On leaving the heat treatment unit 5, the strip 1, fastened to the covering layers 3 and 3', constitutes a laminated strip 6, the deformation and fracture behavior of which is fundamentally different from the behavior of the strip 1 made of nanocrystalline alloy which is essentially brittle. The laminated strip 6 no longer exhibits brittle behavior and its fracture modes are radically different from the brittle fracture modes of the strip 1. Consequently,